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"The Seventh Report"

After reading the "Seventh Report from the Committee on National Expenditure," which deals explicitly with "Research and Development: Warlike Stores," and having visited last week several research laboratories, we feel we can now crystallise our views. In one research department quite an extensive research was being carried out on cast iron. No doubt this organisation is in a position to apply tests of a unique character, but for 80 per cent. of the work it could be profitably farmed out to an association specially qualified to undertake such a task. This is one particular case, and to avoid the fault of arguing from the particular to the general, we will quote the "general" aspect from the "Seventh Report."

"One of the main lessons of modern war has been the essential need for maintaining the closest contacts between all three fighting services and a fully co-ordinated control over their operations in the field. The necessary corollary to this is the establishment of similar contacts and controls in the field of their supply services and of the basic research upon which these in their turn must rely. In the circumstances existing at the outbreak of war each fighting service was primarily responsible for developing, through its own supply organisation, the weapons and stores it required. This system inevitably resulted in parallel and not fully co-ordinated advances in certain fields where more than one service was interested. In the result, there has been a certain degree of overlapping, in spite of later efforts made to minimise this by means of inter-service committees."

By quoting from earlier editorial comment on the subject of financing research, we could show how strongly we deprecated the system of providing co-operative associations with income, whilst completely ignoring the necessity for endowing them initially with capital. Any business man analysing the balance-sheets of a number of the most important research associations would make the observation that the not inconsiderable capital of which they now dispose must have been built up out of funds earmarked for research—pure and simple. Moreover, this is an expensive way of acquiring capital. Thus it is truthful to state that the energies of those responsible for the direction of these associations have, *force majeure*, had to be diverted in a very large measure from their true job to assume the role of a scientific Lazarus. These are the views of the Select Committee on this subject:—

"The inquiries made by the Select Committee during this war have heavily underscored the fact, already long known to those who had direct experience of applying money to research, that the methods of control and accounting most suitable to ordinary administrative expenditure are not necessarily those that lead to the most fruitful achievement of results in research. In particular, money voted for research cannot be most advantageously expended if it is tied down by a detailed and rigid annual estimate. What is needed is that block grants should be sanctioned for specified periods of years."

The Report then makes two recommendations, the first of which is the appointment of a Select Committee to find means of overcoming the present obvious disadvantages, and secondly, increased co-operation with the Dominions. Paragraph 5 of the Report contains a few kicks, of which the politicians should take good note. It reads:—

"These are no light matters. Many examples of wasteful expenditure on warlike stores of all kinds, which it would serve no useful purpose to enumerate, have been brought to the notice of the Select Committee from time to time. Taken together, these conclusively show that the daily cost of this war, at least during the earlier years, was unnecessarily increased and the duration of the war prolonged because of three simple facts—(i) that research had for long been starved; (ii) that adequate steps had not been taken to maintain during the years of peace a nucleus of skilled men which could be rapidly and efficiently expanded for the purposes of war; and (iii) that the system of departmental responsibility was not sufficiently flexible fully to meet the changed requirements."

We deem a rider to fact No. (ii) is necessary, which would read that actually during the war the staffs of research associations were sadly depleted owing to ease with which industry could offer distinctly better emoluments to the young scientist. One final quotation from the Report. This is paragraph 7, and virtually the penultimate one. It reads:—

"On the narrow view, it can be argued that under their orders of reference it is not for a Select Committee on National Expenditure to recommend the increased disbursement of public money. Your Committee and their predecessors during this war have unhesitatingly rejected this

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view. National economy can be firmly based only on the best outlay of the nation's resources. In this instance your Committee are in no doubt that, if research and development are not maintained at a high level and encouraged by the right methods of control and co-ordination, and if terms of employment which will attract the best brains to the service of the State are not offered, the nation's bill for the equipment and maintenance of its forces in a state of fighting efficiency will be disproportionately large, and that in the long run uneconomic restriction in research expenditure and the failure to evolve means of securing the closest contacts between the scientist, the manufacturer and the fighting man must inevitably lead to gross extravagance and perhaps imperil the existence of the nation."

It should be borne in mind that this Report deals with "Warlike Stores," but to those concerned with the rehabilitation of the industrial structure of this country, the argument applies with equal force.

Throughout the Report, there is generous recognition of the value of the research work which has been undertaken, both prior to and during the war. Much was done by private enterprise, and this must continue. Yet increasing collaboration is called for. Mr. Rambush admitted that more information could have been obtained from his daring and novel research by obtaining the views of the highly academical before its launching. Again, Mr. T. H. Turner, discussing Mr. Fry's ingenious work on X-raying the freezing of alloys, commented that he would have expected this type of research to emanate from the great national associations. We, too, had a notion that the perfection of the system for undertaking such work should have been a co-operative problem, leaving the industrial laboratories to apply it to their own alloys. Are we justified in stating that research is like a river—ever widening its course, but unfortunately getting shallower, yet it still has some deep and fast flowing tributaries?

CORNISH TIN MINE CLOSES

The directors of East Pool & Agar, Limited, have notified shareholders that the Ministry of Supply contract for black tin terminates this month. As it is impossible owing to the low grade of ore to continue milling within the Ministry's cost limits, mining has been discontinued. Unless assistance or new capital can be obtained the company will have to be liquidated. In this event the board sees no possibility of any return to shareholders.

FACTORIES BUILT by the Government at Hillington in 1939 and leased to Rolls-Royce, Limited, for the production of Merlin aero engines are to be continued by the company. Experiments are being made with new types of higher-powered Merlin engines and jet-propulsion machines for land and air use. The foundry has been reorganised for peacetime production and has received contracts for castings formerly made in the South. It is the biggest and best equipped aluminium foundry in Europe and will employ more than 2,000 men and women.

FUTURE FOR BOYS IN THE FOUNDRY

The Council of Ironfoundry Associations, 2, Caxton Street, Westminster, London, S.W.1, being aware of the urgency of the problem of the recruitment of youth into the foundry industry, has prepared and issued a 16-page brochure. This publication, by the use of simply-worded letterpress and profuse illustration, has portrayed without exaggeration just what the industry has to offer to the youth of this country. The compiler has indeed had a difficult job, because he was bound to have had in mind the great differences which exist between the amenities available in a back-street workshop and some of the newer installations erected in the outskirts of the great cities. To draw a picture of either would result in giving a wrong impression to youth generally.

The main feature has been well stressed, and that is the chance of advancement to boys of character, perseverance and intelligence. Contrary to accepted notions, the intake of youth to the mining industry was adequate in the years immediately preceding the war. If this be so, there is reason to believe that by the concentration on this problem by as many firms as possible, the situation should be ameliorated in the post-war period. The publication of this booklet augurs a good beginning.

NOTES FROM THE BRANCHES

EAST ANGLIAN SECTION.—A meeting, presided over by Mr. D. Carrick, was held in the Central Library, Ipswich, on June 14. The evening was devoted to the study of interesting features exhibited in castings submitted by Cranes, Limited; Lake & Elliot, Limited; Ransomes & Rapier, Limited, and Reavell & Company, Limited. The representatives of each firm dealt with the points of interest in some detail, and thereafter these features were discussed by the members. It was announced that the next meeting, to be held in September, would take the form of a symposium on inspection and testing, three large local firms being the sponsors.

WEST RIDING OF YORKSHIRE BRANCH.—Two works visits are being organised. The first takes place on June 30, when the Penistone works of David Brown & Sons (Huddersfield), Limited, is to be thrown open for inspection. This includes a large iron and steel foundry, which makes use of the cement moulding system. The second is to take place on August 25, and is to the works of the Renishaw Iron Company, Limited, where a new blast furnace was but recently blown in.

MR. W. MAW, former secretary of John Baker & Bessemer, Limited, has died, at the age of 80. He joined the firm in 1902 and retired from the secretaryship in 1932.

Tentative Recommended Methods for Casting Cast-iron Test-bars*

Report intended to give guidance and information to those in difficulty

By SUB-COMMITTEE T.S.4 OF THE TECHNICAL COUNCIL

The constitution of the Sub-Committee T.S.4 is as follows:—Dr. A. B. Everest, Mond Nickel Company, Limited, chairman; Mr. S. Carter, Kaye & Company (Huddersfield), Limited; Mr. G. L. Harbach, Worthington-Simpson, Limited; Mr. P. D. Pincott, Wallwork Gears, Limited; Mr. R. C. Tucker, M.A., Hepworth & Grandage, Limited; Mr. H. J. V. Williams, John Williams & Sons (Cardiff), Limited; and Mr. W. D. G. Venn (student).

Foreword

Sub-Committee T.S.4 was appointed by the Technical Council in June, 1944, to carry on and to finalise work in hand by the original Cast Iron Sub-Committee on suggested methods of casting iron test-bars. This work was initiated originally on account of the difficulty some foundries experience in the preparation of test-bars and on account also of the wide variation in methods known to be in current use for casting bars. It was also noted that certain foreign specifications incorporate recommendations for casting test-bars, and it was felt that authoritative guidance in this direction was desirable in this country. The terms of reference of Sub-Committee T.S.4 are "to formulate recommended methods of producing separately cast grey iron test-bars as specified in B.S. 321 and 786."

The original Sub-Committee studied methods in current use amongst its members, and found a considerable divergence of opinion as to the steps necessary to ensure consistent and satisfactory results in making test-bar castings. The new Sub-Committee has, however, given these methods further consideration and this Report covers its recommendations for casting bars in both dry- and green-sand moulds to conform with B.S. 321 and 786.

It is recognised that many foundries are successfully using methods of casting test-bars which may differ in many respects from those set out herein. It must be emphasised that the recommendations in this Report are not intended as a standard, and are for the guidance of those who may be in some difficulty and who desire information on the subject.

The methods described are suitable for all sizes of bar required by the current British specifications. Details such as sand mixtures, form of moulding box, etc., are left to the discretion of the individual foundry.

Recommendations

1. *Method of Casting.*—All bars should be cast vertically in accordance with the details below.

2. *Moulds.*—Oil-sand or dry-sand moulds are preferable, but green-sand moulds may be necessary to conform with the requirements of B.S. 321 and 786 when the moulds for the parent castings are in green sand.

3. *Number in Box.*—Bars may be cast simultaneously one or more in a box or core block, but if more than one bar is included in the mould, each bar should not be nearer to any adjacent bar or to a down-runner than 1½ times its diameter.

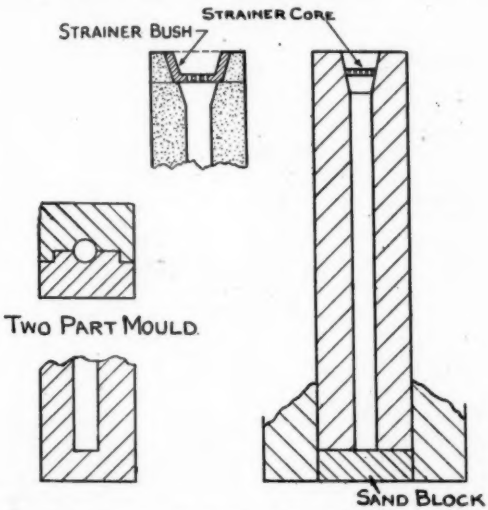


FIG. 1.—SECTION OF ALTERNATIVE MOULD ARRANGEMENTS FOR TOP POURING, WITH TWO METHODS FOR THE STRAINER CORES.

4. *Feeding Heads.*—The use of tapered feeding heads on all bars is recommended. The minimum dimensions of such heads should be as follow:—

0.6	in. dia. Bar		1	in. high.		1	in dia. at top.		
0.875	,,	,,	1½	,,	,,	1½	,,	,,	,,
1.2	,,	,,	1½	,,	,,	2	,,	,,	,,
1.6	,,	,,	2	,,	,,	2½	,,	,,	,,
2.1	,,	,,	2½	,,	,,	3½	,,	,,	,,

* Paper read at the 42nd annual conference of the Institute of British Foundrymen, London, June 15 and 16, 1945.

Casting Cast-iron Test-bars

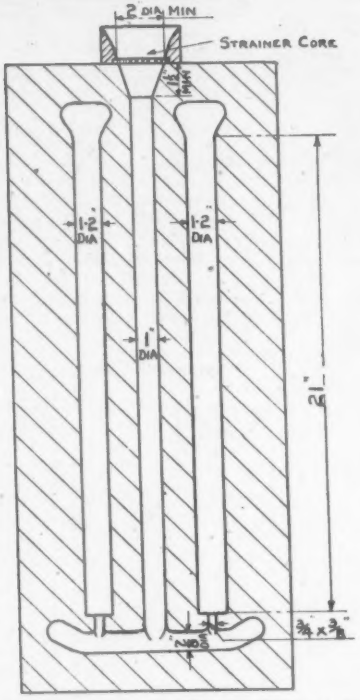


FIG. 2.—DRY OR GREEN SAND. BOTTOM POURED MOULD. (DIMENSIONS AS FOR 1.2 IN. DIA. BAR.)

5. *Mould Dressings.*—No dressing should be needed in oil-sand core blocks or in dry-sand moulds containing 10 per cent. mineral blacking. If, however, a dressing be required, any standard type of wet blacking or silica wash may be employed, but precautions must be taken to ensure that it is applied uniformly and smoothly so as to avoid any interference with the dimensions of the cast bars. No dressing should be used on green-sand moulds.

6. *Patterns.*—The use of metal patterns without taper is recommended. Patterns should preferably be in non-ferrous metal or alloy to ensure smoothness and cleanness. For solid core blocks, patterns may be used in conjunction with a stripping plate and loose tapered collars may be employed to form the heads on the bars.

If split patterns or pattern plates be employed, these should be of metal and precautions must be taken to ensure:—(*a*) Roundness of the bars; (*b*) absence of flash at the joint; and (*c*) freedom from cross jointing or other defective matching of the two parts of the mould.

7. *Method of Running.*—Top- or bottom-pouring methods may be employed.

(*a*) *Dry-sand Moulds and Solid Core Blocks.*—The methods shown in Fig. 1 should be employed when top pouring dry-sand or oil-sand moulds. These call for running through a strainer bush. The strainer bush or core should be made from sea sand, with suitable binder, and should be provided with sufficient ¼-in. or ⅛-in. holes to give a total area about 30 per cent. greater than the area of the bar or runner. Alternatively, split moulds may be used as shown in the sketch, provided attention is given to precautions (*a*), (*b*) and (*c*) in paragraph 6. In this case the mould is made longer than the bar, thus

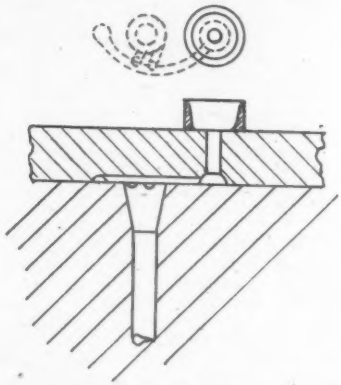


FIG. 3.—RECOMMENDED METHOD OF TOP POURING GREEN SAND TEST-BAR MOULDS.

TABLE I.—*Recommended Dimensions of Downrunner, Sprue and Gates for Bottom Pouring Two Bars as shown in Fig. 2.*

Test bar.		Down-runner.	Sprue.	Ingates.
Dia. in ins.	Length, in ins.	Dia. in ins.	Dia. in ins.	Dimensions, in ins.
0.6	10	⅝	⅝	¼ × ¼
0.875	15	¾	¾	⅜ × 1/16
1.2	21	1	⅞	½ × ⅛
1.6	21	1⅛	1	⅝ × ⅛
2.1	27	1¼	1⅛	1 × 7/16

Note.—The area of the downrunner should be equal to or slightly greater than that of the sprue which, in turn, should be slightly greater than the sum of the areas of the two ingates.

(*Continued on page* 180, *col.* 2.)

THE DEVELOPMENT AND APPLICATION OF PATTERN EQUIPMENT FOR THE PRODUCTION OF A LIGHT ALLOY CASTING

BY F. H. HOULT

Discussion on a Paper read before the London branch of the Institute of British Foundrymen and also presented to the Metropolitan Chapter of the American Foundrymen's Association, Mr. A. J. Murphy, senior vice-president, in the chair. The Author is general manager, Kent Alloys, Limited, Rochester. The Paper was printed in our issue of May 31.

MR. A. LOGAN asked how many castings it was necessary to make in order to justify the extremely well-finished pattern equipment which had been evolved for their production. He suggested that if the number was very considerable, the casting could quite readily be made as a die casting, as it was not a very large casting. The decision must depend, of course, on the number off. At any rate, he suggested that the actual die-casting pattern could be cheaper than the pattern equipment described in the Paper.

After asking what alloy was specified for the casting described, Mr. Logan commented that very obviously the job had been tackled in the right manner from the very beginning. Consideration had been given to the actual design, from the founding point of view, right from the drawing-board stage. It was a sore point with foundrymen that in many cases, after a good deal of time had been devoted to the development of a design, it was found to be quite un-castable.

With regard to the metal corebox, in which were loose cast-iron pieces, he asked how many cores could be made before those pieces had to be renewed. The metal shells, for turning out the cores for drying, represented the ideal, and most foundrymen would like to be able to use such shells for the cores. Again, how many of those shells were used at one time? Obviously, he said, a large number of them would be required, and it seemed that there was a very considerable amount of metal equipment, which was very costly to produce, floating around the foundry.

In a mild criticism of the method of running adopted, Mr. Logan said that all foundrymen were aware of the necessity for avoiding turbulence. It seemed to him that to run the metal straight on to the pattern and the core was not the best method. However, the proof of the pudding was in the eating, and X-ray examination had shown that the castings were sound. He was impressed by the runner/riser ratio, which was quite small.

Possibilities of Die-castings

MR. HOULT replied that the material used was DTD 304 (4 per cent. copper in pure aluminium), and he would not be interested in making his casting as a die casting in that particular alloy. The section of the casting was far too thin to allow of any feeding whatsoever when cast by means of a die; the casting of DTD 304 of that thin section into a die would give rise to considerable trouble due to cracking and due to complete lack of feeding through the tube sections. There would not be much difference between the cost of the die-casting equipment and the pattern equipment; but the percentages of scrap in the two cases would bear no comparison.

With regard to hand-moulding pattern equipment, designed, as he had explained, with the two arms loose, there would be a tendency to distortion, and after the production of half-a-dozen castings he would not guarantee consistency in the remainder. He suggested that the hand-moulding pattern should not be used for those castings; the prototypes could be produced, but nothing further than that. The piece in the T-corebox must be rammed solid after the two ends were made and put together. As to the cast-iron pieces in the metal corebox, he suggested that after possibly a thousand cores had been made it would be necessary to renew those pieces.

Dealing with the question concerning the driers or shells or duplicate halves of the bottom of the corebox, he said the only three names he had heard applied to them were core driers, core shells and core carriers. The number of shells in use depended on whether or not the job was in continuous production. It was a question of balancing the coremaking against the moulding, of ensuring that the time cycle in the coreshop was such that the shells could be returned quickly. In the case dealt with in the Paper, he had made only 20 shells; after 20 of one core were made, the operators changed over to the other core; when the operators had made 20 of the latter, the shells for the first core were returned. Those 20 shells ensured the maintenance of a steady flow. Finally, he agreed with Mr. Logan that the runner/riser ratio on the casting discussed in the Paper was as low as could reasonably be expected.

MR. V. C. FAULKNER recalled the American practice of placing small carborundum studs at the corners in the bottom of the coreboxes to prevent wear and asked whether Mr. Hoult had adopted it. Otherwise it was found that wear occurred at the bottoms of the boxes after two or three thousand cores were made.

MR. HOULT replied that the corborundum studs were used only when cores were actually blown; for hand-moulding methods of core production the abrasion problem could be covered amply without carborundum inserts in the coreboxes.

Core Assembly and Accuracy

MR. VICTOR MOYLE, pointing out that the jig for the core would take only half of it, asked what happened when the core was stuck together. He wondered whether the height was increased, and pointed out that there was no jig to allow for that. When the two halves of the core were put in, was there an appreciable amount of flash between them.

Asking whether there was any rubbing of the surface of the sand when the core came well back and had to be pushed forward, he said it seemed to him that

Development of Pattern Equipment

rubbing should occur; if not, he would like to know how it was avoided. Presumably the work was done on mass-production lines, by unskilled or semi-skilled labour. Finally, he asked what sand was used for making the cores.

MR. HOULT replied that, in placing the half core in the rubbing jig, an allowance was made of approximately 10 thousandths for each half of the core, for the swelling which occurred in the core jointing material. The height of the jig was 10 thousandths less than that of the print on the pattern. When joining the two cores the overall length was checked, and the variation was found to be so slight as to be negligible, even when working to the fine limits mentioned in the Paper. Therefore, the variation which occurred on the height of the two cores was ignored. The production method had been to join the cores and to seal the joint first. But in producing the casting the method was to place half the core in the top part and close the other half in the bottom, and the flash was very small, as shown by the sample. The alloy DTD 304 was so very quick setting and could be referred to as a hot-short metal, so that there was very little penetration into the flashes.

With regard to the question concerning the rubbing of the core when it was slid along, Mr. Hoult invited his hearers to feel the surface of the core. The surface, he said, became very hard and had a mirror finish, and one could squeeze it along without any rubbing whatsoever. There should be no disturbance whatever of the surface of the sand. For the core sand mixtures he used a compound and a cereal binder. The cores were made from sand which was not dried when it came into the foundry, and to which a cereal binder had been added. He also used a compound for the T-core, which had to be knocked out and which must contract very quickly. The outside cores were made with a cereal base.

Coremaking Methods

MR. WILLIAMS suggested that, with regard to the large block core used, the human element was likely to give rise to dimensional errors.

MR. HOULT, referring to the suggested ramming or jolting of the large core, emphasised that the slight undercut which was necessary in order to form the barrel of the casting would give rise to a soft spot at the one place where the core must not be soft. If he had resorted to jolting, the core would not have been solid at that place; it would have to be rammed under the undercut on the box and turned out on to the flat face. It had been made at his works only by hand-production methods. Not only must it be solid, but it must also be dimensionally accurate and must allow of no sag. By adopting the method of splitting it and giving the minimum amount of height he had also ensured the minimum amount of sag on the core.

MR. WILLIAMS said the corebox had been designed for use by hand, and he gathered that all the cores were made by female labour.

MR. HOULT added that if it were decided to blow the cores he would have used cast-iron boxes throughout and would have provided some form of lifting device for them. The coreboxes were made in aluminium because the cores were to be made by female labour and by hand.

MR. MASTERS, a visitor from the Lancashire branch, asked why a compound was used for the T-core.

MR. HOULT said he preferred to use a compound for any internal core mainly from the point of view of ease of knock-out. On the question of discoloration, he said that that arose more from the compound than from the core binder. The problem of core binders was tremendously wide and would provide material for a whole series of lectures. Recalling the American film on the production of cylinder heads, which film was viewed by the members of the branch during the previous session, he said the core sand used was described therein as being very light, having practically no green bond and no moisture content; the Americans were relying purely on the bond due to an oil. We in this country, on the other hand, favoured a much stronger green bond. The Americans relied on the green bond provided by an oil, and not on the bond provided by a cereal base.

MR. TAYLOR asked if Mr. Hoult had tried blocking the ends of the three-way core.

MR. HOULT replied that he would not adopt the method of closing the ends of the boxes in that particular case. If he did that and, after the core was finished, rapped the box with a mallet, the dimension of the core was bound to be less than the dimension in the corebox, for the rapping would vibrate the box and disturb the core. It was vitally important that the height should be maintained, otherwise there would be thin sections on the part of the casting at the bottom of the T.

Block Core Moulding

MR. WARRINGTON (Slough) admired the ingenuity which had been displayed in the planning of the work, and felt that Mr. Hoult had been most fortunate in regard to the casting with which he had dealt. He had got away with the most simple runnering and risering that could be devised, particularly suitable for DTD 304, the properties of which were quite reasonable for a casting of such even section. With regard to the moulding, he wondered whether it would have been worth while making block cores and producing the whole job by cores.

The fact that the job had been laid out in the manner described in the Paper, he continued, gave rise to some trepidation. Whilst the foundry industry owed much to men such as Mr. Hoult, who had been properly trained in the foundry and were able to apply such careful planning to the production of such a component as was described in the Paper, one could not help but feel that in the future, when semi-skilled and unskilled labour could be employed in the production of such castings, planned in such a way, there

would be very little scope for the training of men who were to become foundry executives. There would be little room for the skill of an apprenticed and trained moulder in a foundry in which a job was laid out in a manner such as that described in the Paper, and he felt that in the not far distant future there would be a real dearth of skilled foundrymen who would be able to hold such positions as that of Mr. Hoult and carry on the work.

MR. HOULT commented that in provoking Mr. Warrington's criticisms he had achieved one of the objects that he had set himself when preparing the Paper. On the question as to whether or not the particular mould described should be dry or whether the job should be constructed as a core and without a moulding box, he felt that that depended on the quantity of castings to be produced. He had been very much accustomed to using moulding boxes, and the particular castings he had described were cast in green sand. He readily agreed that if, in the first place, it had been decided to make block cores and to produce the whole job by cores, the results would have been very similar to those achieved. But by using a green-sand mould he had saved the weight of core sand per core which would otherwise be thrown away, and that justified the making of a green-sand moulding and using a moulding box instead of producing from cores. After all, there was nothing intricate in the mould, no fine pins, etc., which had to be withdrawn very carefully.

With regard to training in the foundry, Mr. Hoult said he viewed with regret the very small influx of youngsters into the foundry industry; one of the objects of the Institute of British Foundrymen was to promote the interest of young men so that they would take up the skilled work. Although the particular casting he had described was produced on a moulding machine by unskilled labour, there were many other castings the making of which demanded the application of the maximum skill. The casting he had discussed was a fairly simple job; but as we progressed in the post-war period there would be more and more of the intricate castings to make, and there would be a shortage, as indeed there was already, of young recruits to the foundry industry.

Dimensional Tolerances

MR. E. H. BROWN asked what were the actual dimensional tolerances to which one could work in producing the casting described in the Paper.

MR. HOULT replied that his firm formed part of a larger organisation and the latter recently had asked for a tolerance on all casting drawings of $\pm \frac{1}{64}$ in. That was the standard which was set the Inspection Department. It was reasonable, and was as near as one could get on a production casting.

MR. A. LOGAN, emphasising the great importance of the question of tolerances, said that a recently-formed sub-committee of the Institute's very active Technical Committee was to investigate tolerances and the dimensional accuracies of castings. He asked for Mr. Hoult's opinion as to the actual tolerance required for work such as that described in the Paper, and with what variations he was able to keep within that tolerance. It was rather surprising that he was allowed as much as $\pm \frac{1}{64}$ in.; one would have thought that, when using such accurate equipment as had been described, he could have worked to limits much finer than that when producing castings of the kind under discussion. That did not mean necessarily that one wanted to reduce the tolerance; but one would have thought that he could have worked to greater accuracy, bearing in mind that he was using pattern equipment which represented the last word.

MR. HOULT emphasised that the tolerance of $\pm \frac{1}{64}$ in was that which was shown on all drawings. He was inclined to express his sympathy with any committee appointed to discuss the tolerances allowable on castings, because that problem represented a tremendous headache; there must be variation from shop to shop and from casting to casting. The sub-committee which was tackling tolerances must have a tremendous overriding view of the whole industry. The tolerances depended to a large extent on the customer, from the point of view of how much he was prepared to pay for the pattern equipment in order to guarantee true reproduction of the casting. Again, Mr. Hoult was firmly convinced that tolerances were often a question of cores and core-sand mixing; the amount of sag that could occur in a core was considerably more than $\pm \frac{1}{64}$ in. That raised all sorts of queries as to how the tolerances should be maintained and how the standard could be maintained. There was the old argument as to whether a round core should be made as a complete circular core or should be made in two halves and dried on a flat plate. He maintained that the only way in which to produce accurately a simple round core was to split it into halves, jig each half and join them. There were variations in the core sand and in the amount of oil in the core sand.

MR. TAYLOR suggested that one could perhaps chromium-plate the box pins; but even then, he said, one must have at least a 5-thousandth tolerance on the pins.

MR. HOULT said that the tolerance could work both ways, which would give 10-thousandths. One needed a very accurate mould with loose pins, and he did not think it would be quite fair to ask for anything finer than 15 thousandths. One would have to check every box before it went on and check the pins twice a day in order to improve upon a 15-thousandths tolerance.

The CHAIRMAN (Mr. A. J. Murphy) asked whether Mr. Hoult would wish to alter the method of running the casting if he were using a different alloy. He suggested that the casting was too simple to illustrate the point, and said it seemed that he had not had to make any allowance for the fact that the alloy used was DTD 304. Would he contemplate a different method of moulding if the casting were produced in L 33?

With regard to the control and handling of the metal in the foundry, it looked as though the rate of running the casting and filling the mould did not matter very much; but was the metal temperature very critical and, if so, had variations in that factor been reflected

Development of Pattern Equipment

in the standard of production and the proportion of scrap?

Asking whether there had been an opportunity to make strength determinations on samples cut from the actual casting, the chairman said it was for the ultimate good of the industry that attention was being concentrated more and more on the properties obtainable in the actual castings. The industry had lived for a long time with the myth of the separate test-bar, overriding a good deal of the technical considerations. But it was becoming recognised by designers that it was not always good procedure to relate the design of the casting simply to the strength obtainable in a separate test-bar. Was there any experience available on the strength in the actual pieces of the castings made in DTD 304, which alloy was used because of the high nominal strength obtainable in it? Finally, the chairman expressed his personal indebtedness to Mr. Hoult for his Paper, and admiration for his complete grasp of the subject.

MR. HOULT, in reply, said if he had to use alloy L 33 for that casting he would suggest taking the runner along to the far outside. From his practice and experience he did not think he would run it at the centre if he had to use L 33. Expressing the wish that customers would take more sample test-pieces from castings, he said that, whilst he had not taken samples of the thin section of the casting he had discussed, he had taken samples of DTD 304 from castings of similar section and had obtained results 40 per cent. above the tensile requirements. In the majority of cases, when using DTD 304, he could guarantee that the test figures obtained from the castings were well in excess of those obtained from test-bars. In the particular casting he had discussed he could guarantee that the tensile strength was 40 per cent. above requirements, due to the thin section and the even chilling.

The CHAIRMAN asked why Mr. Hoult would change his method of pouring if he were using L 33, for one would have thought that his arguments would have been applicable to any aluminium alloy.

MR. HOULT replied that unless the metal were run from the end, in L 33, there would be liability to sodium-gas porosity at the centre.

Vote of Thanks

MR. LOGAN, proposing the hearty thanks of the branch to Mr. Hoult for his Paper and for his handling of the discussion, said that one was lost in admiration. Mr. Hoult had proved himself to be a staunch supporter and friend of the London branch on more than one occasion. The criticism was made sometimes that some of the meetings of the Institute were becoming too highbrow, that there was much discussion on metallurgical lines instead of on practical foundry work. That criticism, however, could not be levelled at Mr. Hoult's Paper, which dealt with practical foundry work, and it had afforded the meeting very great pleasure, as well as instruction.

MR. WARRINGTON, seconding, said it was a refreshing

(*Continued at foot of next column.*)

TENTATIVE RECOMMENDED METHODS FOR CASTING CAST-IRON TEST-BARS

(*Continued from page* 176.)

dispensing with the sand block at the base. The method shown in Fig. 2 is suitable for bottom running dry-sand moulds.

(*b*) *Green-sand Moulds.*—The method shown in Fig. 2 is recommended. This covers bottom running and using a strainer bush on the runner and with dirt traps in the bottom cross-runner. Table I indicates recommended dimensions for the down-runner, sprue and in-gates. If top running be preferred, the method shown in Fig. 3 is suggested.

8. *Temperature of Pouring.*—For medium and light work the temperature of pouring should be the same as for the parent casting. For heavy work the temperature should be as high as conveniently possible, but with inoculated irons the bars should be run at the same time as the casting. Metal should be taken in a well-preheated ladle or spoon directly from the bulk ladle, and should not be taken at the cupola spout, as this metal may not be truly representative of the quality or temperature of the bulk.

COMBUSTION APPLIANCE MAKERS

The Combustion Appliance Makers' Association has recently decided to expand its organisation to assist in the many problems of industrial re-equipment and house construction which will arise after the war. In connection with the annual general meeting called for July 25, there will be a special general meeting to adopt a new constitution.

Mr. W. Rennie (Federated Foundries, Limited), who has held office as president since the outbreak of war, has announced his intention not to seek re-election, and a new president will be chosen at the meeting. Mr. P. A. H. Elliot, until recently the head of the liaison department of the British Coal Utilisation Research Association, has been appointed director in succession to Mr. J. G. Bennett.

(*Continued from previous column.*)

change to have a Paper presented on *a* casting. Many Papers had been presented on castings and moulds and metals in general; but it was a real pleasure to have one casting singled out and discussed in detail. Further, the description of the technique which Mr. Hoult had adopted for the production of the casting, and one's appreciation of the care which was necessary in producing the moulds and cores, rendered the Paper still more enjoyable.

The vote of thanks was carried with enthusiasm.

MR. HOULT, in his response, said he hoped particularly that some of the younger members of the Institute would read the Paper, for he was really concerned that not sufficient attention was being paid to the younger members. He asked for the support of all the older members in passing on knowledge to those who were to follow them.

A NOTE ON TAPERS

By "Chip"

Taper or draft is necessary to enable a pattern to be easily withdrawn from a mould. Whilst the foundryman desires the maximum possible, the engineer usually prefers his castings "square." A compromise has therefore to be affected, and attempts have been made to agree on a standard taper. This obviously has its disadvantages, as varying jobs demand different treatment. Sole or bedplates, for instance, can carry a generous taper without affecting any other component, but jobs which have to suit others have to carry a minimum of taper. Indeed some castings are required

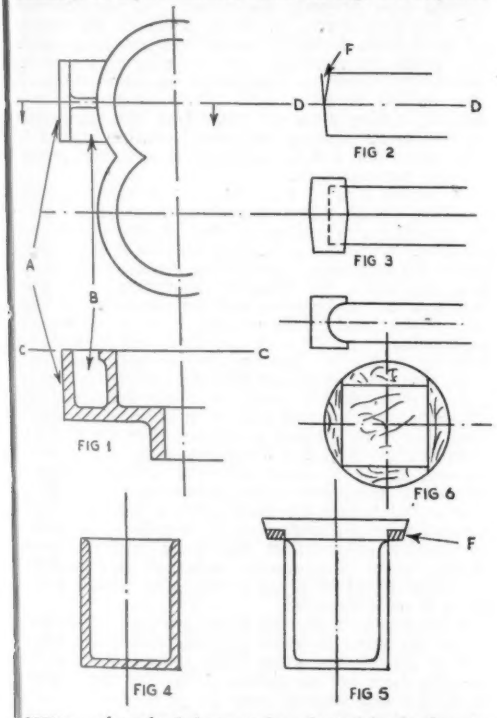


FIG 1 FIG 2 FIG 3 FIG 4 FIG 5 FIG 6

square, and methods have to be adopted in the foundry to cater for the needs of the engineer. This can be accomplished in numerous ways, depending upon circumstances.

For example, in Fig. 1, which is a portion of a particular type of gearcase face, A is required "cast square and as smooth as possible." As a core is required to carry portion B, the joint being along CC, the face A can conveniently be dovetailed on the core print and drawn in, thus eliminating taper on this face. Fig. 2 shows another case. A casting is required with a semi-circular end to suit another without undue fitting. Because of other detail, the job has to be jointed through DD, and would normally carry a taper as F. To avoid this, a core is used to form the end as Fig. 3. The top half carries a clearance to avoid a crush on assembly.

Fig. 4 shows a casting required of a given diameter and parallel and to conform to a specific weight, consequently taper was not permissible. The method adopted to satisfy the engineer was to use a pattern as Fig. 5, in which part of the core print F was a brass ring. This served as a "stripping plate," and allowed of a pattern with parallel sides being used.

For large circular jobs, say of 3 ft. or more in diameter, a method of eliminating taper is to make a square centre piece with a maximum of taper, and around this place four pieces, as Fig. 6. After ramming, the centre piece is withdrawn and the sides drawn in slightly and up. Not only circular patterns, but large jobs of all descriptions can be treated in the same way.

CADMIUM FOR EXPORT

The Minister of Supply has made the Control of Non-Ferrous Metals (No. 18) (Cadmium) Order, 1945, which came into force on June 8. It varies the Control of Non-Ferrous Metals (No. 6) (Cadmium) Order, 1941, by exempting from the operation of the maximum price provisions cadmium (whether virgin or secondary) in the form of ingots, sticks or rods, which is delivered or intended to be delivered outside the United Kingdom or on board ship for export from the United Kingdom.

Inquiries concerning this Order should be addressed to the Joint Controllers, Non-Ferrous Metals Control, Grand Hotel, Rugby.

FLUORSPAR CONTROL REVOKED

The Minister of Supply has made the Control of Fluorspar (No. 2) (Revocation) Order, 1945, which revokes the Control of Fluorspar (No. 1) Order, 1942, by which the disposal and acquisition of fluorspar containing more than 60 per cent. calcium fluoride was made subject to licence. All restrictions on the sale and purchase of fluorspar are thereby removed.

Copies of the Order may be obtained from H.M. Stationery Office (price 1d.).

The War Finance Division of the American Treasury Department stated on June 1 that military rockets would be supplied at the rate of more than 1,000,000,000 dollars' worth a year. The programme for rocket projectiles calls for an output which will surpass in one month the total production of rockets for 1944, according to information given by Mr. Ted R. Gamble, national director of the War Finance Division.

CORRESPONDENCE

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

BLASTING OF CASTINGS AND OTHER ARTICLES IN FACTORIES

To the Editor of THE FOUNDRY TRADE JOURNAL.

SIR,—For many years attention has been drawn in the annual reports of the Chief Inspector of Factories to the risk of contracting silicosis incurred by persons engaged in or in connection with "sand-blasting," a risk to the gravity of which the certificates of death, disablement and suspension on account of the disease, issued every year by the Silicosis Medical Board, are witness. During the years 1932-1941, 114 such certificates (41 of which were in relation to deaths) were issued for "sand-blasters" engaged in the processes to which the Silicosis Compensation Scheme* applied. Moreover, the Factory Department have records of other fatal cases among sand-blasters in various industries.

These totals are not in themselves large, and it might seem at first sight that the occupation is relatively safe when comparison is made with the number of cases occurring in other silicosis producing industries. Medical and other investigations have, however, shown that the figures are small only because relatively few persons are engaged in the process, and that the risk in "sand-blasting" is, in fact, extremely high.

The risk has been removed or reduced in a number of cases by the use of non-siliceous abrasives (*e.g.*, metal shot, metal grit, or aluminous grit) in the "blasting" apparatus and by other precautions; but the figures quoted above indicate that such measures need to be extended and improved upon, and the matter has been more thoroughly gone into by a Joint Committee on Dust in Steel Foundries, this being a class of works in which "blasting" is done to an extent which has afforded valuable practical guidance as to the use of non-siliceous abrasives and as to the efficacy and weaknesses of various precautions. The committee have now recommended (i) that the use of siliceous abrasives in "blasting" apparatus should be prohibited and (ii) that more elaborate precautions should be required in the cleaning of castings. (In the case of that process the silicosis risk would not be removed merely by using a non-siliceous abrasive in the blasting apparatus.)

In the light of these recommendations the Minister proposes to make Special Regulations under the Factories Act, 1937, for factories in which "blasting" is done. Incidentally, they would supersede certain regulations in the existing Grinding of Metals (Miscellaneous Industries) Regulations, 1925, in the case of factories to which that Code of Regulations applies. Since those Regulations were made a type of blasting apparatus has come into use in which the abrasive is propelled by a wheel. The risks are of much the same nature as from blasting by means of a jet of abrasive propelled by compressed air, and the proposed Regulations are designed to cover this method of blasting also. Part II (Regulation 5) of the proposed Regulations contains a general prohibition of the introduction of siliceous abrasives into blasting apparatus Part III (Regulations 6-18) contains revised requirements in connection with the cleaning of castings.

The aim of Part III is, in the first place, to give greater protection for persons working inside a blasting chamber. The prevention of the inhalation of dust by such persons depends on the wearing of a suitable protective helmet provided with a sufficient supply of fresh air, and on the maintenance of adequate exhaust ventilation applied to the chamber. The proposed Regulations require the provision of helmets of approved type properly maintained and supplied with not less than 6 cub. ft. of air a minute, the wearing of the helmets during the whole time persons are working inside the chamber, and the maintenance of the ventilating plant in continuous operation whenever the blasting chamber is in use, whether blasting is actually taking place or not. This last requirement applies to all blasting enclosures, whether entered by persons or not, and is intended also to protect persons outside the enclosure.

A second aim of Part III is to safeguard persons working outside blasting enclosures, more especially by preventing the escape of dust produced in the enclosures. With this in view, in addition to the requirements for mechanical ventilation, the Regulations contain provisions for frequent inspection and good maintenance of the plant and the prevention of leakages of dust, and for the protection of persons engaged in cleaning or repair work outside as well as inside the blasting enclosure. The Regulations specifically provide, also, that doors of blasting enclosures must be kept closed while blasting is being done; and the committee recommend that in practice a reasonable time should be allowed to elapse, after the blast has been turned off, before the doors of the enclosure are opened, having in mind that even when the blast is turned off some dust is liable to escape if the doors are opened before the dusty air has been completely scoured from the enclosure. It is also suggested that in practice every effort should be made to locate blasting plant near outside walls and that particular attention should be given to this point whenever new plant is being installed.

A third aim of Part III is the protection of persons at an age when they are specially susceptible to the risk of silicosis and more liable to incur it. For this purpose there are provisions prohibiting the employment of young persons under 18 years of age at work where they would be exposed to the risk.

In accordance with the prescribed procedure for making Special Regulations under the Act, the Minister has given notice that he proposes to make Special Regulations as in a draft which has been prepared, copies of which can be obtained from H.M. Stationery Office, and that any objection must be sent to him in writing on or before July 24, 1945.

Yours, etc.,

G. R. BUCKLAND.

Ministry of Labour and National Service.

* The Various Industries (Silicosis) Scheme, 1931—S. R. & O. 1931, No. 342.

PERSONAL

MR. N. CLARKE has been appointed assistant secretary of the Institute of Physics.

MR. J. S. KER has resigned from the board of the Indian Iron & Steel Company, Limited. MR. C. H. HEAPE has been elected a director.

MR. DAVID KIRKWOOD, JUN., has received the permission of the Ministry of Supply to relinquish his post as Deputy-Controller for Die-castings and Labour in the Non-Ferrous Metals Control of the Ministry in the light of medical advice following a serious operation.

ENGINEER REAR-ADMIRAL D. J. HOARE has, with the consent of the Admiralty, been appointed director of research to the British Internal Combustion Engine Research Association. Admiral Hoare is at present Superintendent of the Admiralty Engineering Laboratory. He is expected to take up his new duties on July 23.

MR. H. DOUGLASS, who has been appointed assistant general secretary of the Iron and Steel Trades Confederation, was formerly a branch official of the organisation in the Cleveland area of Yorkshire. He was later appointed organiser in the Manchester area, after which he became divisional organiser for the same area.

MR. ANDREW GRAHAM has been appointed as engineering representative for Eire of Specialloid, Limited. MR. K. D. WEST has been appointed as district engineer for the Southern Counties, assisting Mr. W. G. P. Rogers. MR. GORDON RAMSDEN has taken up his post as area manager and engineer for Yorkshire, Northumberland and Durham.

MR. F. J. E. TEARLE has been appointed a director of the Metropolitan-Vickers Electrical Export Company, Limited, and retains his appointment as principal representative. Mr. Tearle has seen naval service in the present war as Lieutenant, R.N.V.R. He was recalled from the Middle East at the end of 1942 to take charge of certain special contracts.

MR. J. F. PERRY has been appointed general manager of the Metropolitan-Vickers Electrical Export Company, Limited, and relinquishes his position as sales manager of the plant department. After the last war Mr. Perry rendered valuable service to the French Reconstruction Committee in replanning the devastated collieries in Northern France. He has travelled extensively in Australia, Africa and Europe in connection with M-V. mining interests.

MR. J. F. BRIDGE, secretary of John Brown & Company, Limited, and Thos. Firth & John Brown, Limited, Sheffield, is to retire at the end of June. He went to Sheffield in 1899, having previously served for some eight years in the offices of the Newcastle agents of John Brown & Company. MR. J. W. BECK, now Clydebank secretary of John Brown & Company, Limited, will succeeed him as secretary of that company; and MR. C. STOKES, assistant secretary of Thos. Firth & John Brown, Limited, will become secretary of that company.

MR. H. WARREN has been appointed managing director of the British Thomson-Houston Company, Limited, Mr. Warren is 53 years of age, and joined the B.T.H. Company (in the testing department) from Bristol University in 1911. He was appointed to the engineering staff in 1913. In 1921 he became "Engineer of Insulations," and in 1923 he collaborated with the late Mr. R. C. Clinker in instituting the B.T.H. research laboratory. In 1929 Mr. Warren became chief of the research laboratory, and in 1938 he was elected to the board of the company as director of research. Recently Mr. Warren was appointed director of research and engineering.

MR. I. R. COX has been appointed managing director of Metropolitan-Vickers Electrical Company, Limited. He is 54 years of age, and holds a degree in Science at University College, Cardiff, and is a M.I.Mech.E. and A.M.Inst.C.E. Before the last war he was apprenticed with Metropolitan-Vickers Electrical Company, and in 1913 was assistant turbine engineer. In 1927, he went to Russia as chief mechanical engineer in charge of turbine work in that country, and has since visited Australia and America on the company's business. In 1941, he was appointed joint managing director of Metropolitan-Vickers Electrical Export Company, Limited, and joined the board of Metropolitan-Vickers Electrical Company in 1944.

MR. J. P. V. WOOLLAM, of the chemical plant department of Simon-Carves, Limited, Cheadle Heath, Stockport, has been elected a director of the company. The younger son of Alderman Woollam, a past Lord Mayor of Manchester, he joined the staff of Simon-Carves in 1916 immediately on leaving school, and, apart from 12 months in the Royal Air Force in 1918, he has been with the firm ever since. He is a member of the Institution of Chemical Engineers and a committee-member of the newly-formed North Western Branch. He is also an associate of the Manchester College of Technology. Mr. Woollam has undertaken many journeys abroad for his firm, and already this year has visited America and the Dutch West Indies. A well-known lacrosse player, he played for Great Britain in the Olympic Games at Amsterdam in 1928.

LT.-COL. G. J. W. TURNER, M.C., whose home is at Westfield Road, Edgbaston, Birmingham, has joined the Control Commission for Germany (British Element), Economic Division, and will be proceeding to Germany shortly. He has been appointed controller of a section of the ferrous metals industry, embracing steel wire rods, steel wire, wire ropes, hot-rolled tubes, and nuts and bolts. Lt.-Col. Turner is the only son of Mr. Walford H. Turner, chairman of Wrights' Ropes, Limited. In business he is associated with the Wrights' Ropes organisation, and is a director of the Rollason Wire Company, Limited. Recently promoted to the rank of Lieutenant-Colonel, he joined the Staffordshire Yeomanry some years before the war and served for four years in the Middle East. He fought in Syria and was mentioned in despatches. Later, he was with the Eighth Army from El Alamein to Tunis, and was wounded. He was awarded the M.C. He landed in France on D-Day and went through to Bel-

gium and Holland, and was again wounded when his tank received a direct hit and was set on fire. Latterly he has been with a tank-training regiment.

MR. B. N. WALLIS has been awarded the James Alfred Ewing Medal for 1944, on the joint recommendation of the presidents of the Royal Society and the Institution of Civil Engineers. The medal is awarded annually by the Council of the Institution of Civil Engineers for specially meritorious contributions to the science of engineering in the field of research. Mr. Wallis is chief of aeronautical research and development to Vickers-Armstrongs, Limited. He invented and designed the special-type bombs used for the destruction of the Moehne and Eder dams in Germany in 1943, and designed the "tallboy" and 10-ton bombs used by the R.A.F. He was responsible for the design and construction of the airship R.100. Since the airship programme was abandoned, he has been engaged in the design and development of geodetic construction to enable the production of long-range load-carrying aircraft, as exemplified in the production, in collaboration with Mr. R. K. Pierson, of the "Wellesley" type monoplane, which holds the world's non-stop record of 7,162 miles made in 1938. Geodetic construction has been used in the well-known "Wellington" bomber and the "Warwick."

SIR PETER B. BROWN retires from the chairmanship of Hadfields, Limited, Sheffield, on June 30. He is to be succeeded by LT.-COL. LORD DUDLEY GORDON. Sir Peter and MAJOR A. B. H. CLERKE, deputy-chairman, retire from the board and, therefore, as managing directors of the company. MR. J. B. THOMAS has been appointed general manager of the company, and MAJOR H. G. FREEMAN has been elected to the board as from July 1 next. Sir Peter Brown joined the company as draughtsman and assistant manager in 1888, was appointed a director in 1909, joint managing director in 1917, and followed the late Sir Robert Hadfield as chairman in 1940. He was knighted this year. Sir Peter is a vice-president of the Iron and Steel Institute. He was Master Cutler of Sheffield in 1930-31. Lt.-Col. Lord Dudley Gordon joined the board of Hadfields in 1943. Major Clerke left Woolwich in 1911 to take charge of the ordnance side of Hadfields, Limited. He was made a director in 1913 and a joint managing director in 1917, becoming deputy chairman on the death of Sir Robert Hadfield. Mr. J. B. Thomas joined the board of Hadfields in 1936. He has been financial adviser to the company for over 20 years. Major Freeman retired from the Army in 1938 to join the staff of the company. Since going to Sheffield he has taken a prominent part in the ordnance side of the company's business. He was appointed a local director in 1943.

THE DEMAND FOR CASTINGS in the United States since D-Day shows no decline. The supply of malleable castings is still inadequate to meet military needs, despite the fact that the March production at 86,000 short tons was a record. Unfilled orders have increased from 483,981 tons in January to 500,000 tons in March.

BIRTHDAY HONOURS

A number of industrialists received awards in the recent Birthday Honours List. Among them were the following:—

SIR EUGENE RAMSDEN, BT., M.P., who becomes a baron. He is a member of the Department of Overseas Trade Development Council. Sir Eugene is chairman of A. & S. Henry & Company, Limited, Crosthwaite Furnace & Scriven Machine Tools Company, Limited, and Richard Johnson, Clapham & Morris, Limited, deputy-chairman of Thomas Bolton & Sons, Limited, and a director of British Insulated Cables, Limited, G. Beaton & Son, Limited, and other companies.

MR. WILFRID AYRE, who receives a knighthood, is chairman and managing director of the Burntisland Shipbuilding Company, Limited, and a director of Hall, Russell & Company, Limited, Marine Propulsion, Limited, National Shipbuilders Security, Limited, and Shipbuilding Corporation, Limited.

SQUADRON COMMANDER JAMES BIRD, R.N.A.S. (retired), general manager of Vickers-Armstrongs, Limited (Supermarine Works), also receives a knighthood.

MR. CLAUDE DIXON GIBB, another new knight, is Director-General, Armoured Fighting Vehicles Production and chairman of the Tank Board, Ministry of Supply. He is a director of A. Reyrolle & Company, Limited, and C.A. Parsons & Company, Limited.

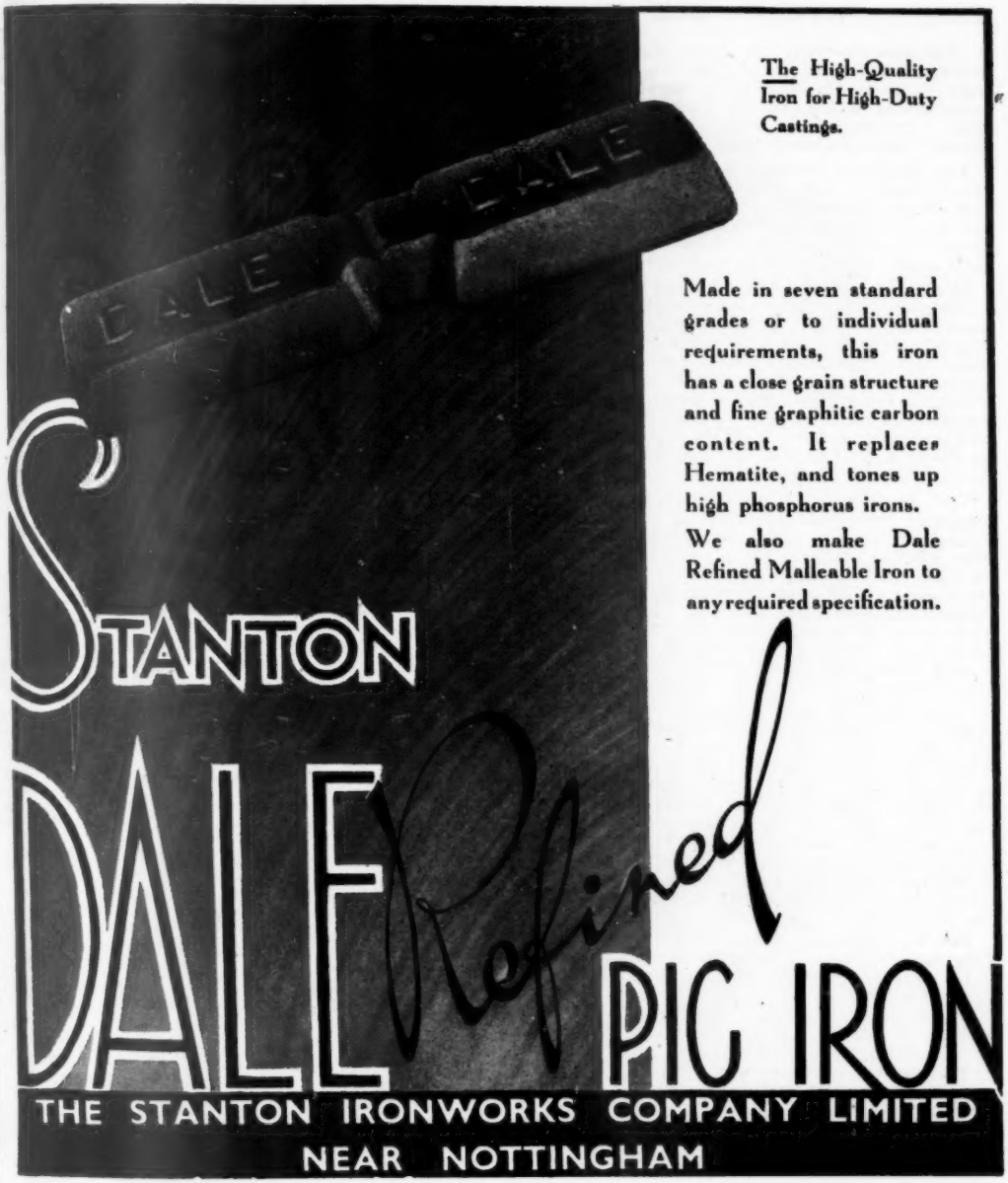
Among those to receive the C.B.E. are:—MR. LORIS EMERSON MATHER, Regional Controller, Ministry of Production, chairman of Mather & Platt, Limited, and of Food Machinery (M. & P.), Limited, and a director of the Lancashire Steel Corporation, Limited; MR. ERIC MENSFORTH, a director and deputy-managing director of Thos. Firth & John Brown, Limited, and vice-chairman of Westland Aircraft, Limited, and previously assistant managing director of Markham & Company, Limited; and MR. WILLIAM MURE, Joint Non-Ferrous Metals Controller, Ministry of Supply, a managing director of the British Metal Corporation, Limited, and a director of the Amalgamated Metal Corporation, Limited, British (Non-Ferrous) Mining Corporation, Limited, Manganese Bronze & Brass Company, Limited, and other companies.

DUPLEX MALLEABLE IRON

An eight-page pamphlet written by Mr. Wilfred H. White, of the Jackson Iron & Steel Company, of Jackson, Ohio, U.S.A., relates in simple language the benefits to be derived from duplexing and, incidentally, the use of "Jisco" silvery pig-iron (10 per cent. silicon). He has made this available to our readers on request.

AMERICAN SHIPS are now being supplied with aluminium lifeboats.

OWING TO THE SHORTAGE of steel castings, an American steelworks has used Meehanite for casting pit cover frames.



The High-Quality Iron for High-Duty Castings.

Made in seven standard grades or to individual requirements, this iron has a close grain structure and fine graphitic carbon content. It replaces Hematite, and tones up high phosphorus irons.

We also make Dale Refined Malleable Iron to any required specification.

NEWS IN BRIEF

"FOUNDRY PRACTICE," the house organ of Foundry Services, Limited, of Long Acre, Nechells, Birmingham, 7, in its May-June issue, opens with a well-authenticated article on the "Inoculation of Cast Iron" and terminates with one on "Manganese Bronze," making a nicely balanced publication.

THE NATIONAL FEDERATION OF IRONMONGERS will give specialised trade information to ex-Service men and women desiring to enter the retail ironmongery and hardware distributive field. Inquiries for advice should be notified to British Legion branches. Why not a similar arrangement by the foundry industry?

MORE THAN 1,000 jobs for moulders are available in Stirlingshire foundries as soon as skilled men are released from war work and the fighting Forces. The foundries have received large orders for firegrates for temporary and permanent houses, but are being handicapped by shortage of labour. One firm has been given a contract for 50,000 fires of a special type, and other foundries expect to be fully occupied for several years on Government orders. It will be impossible for them to supply normal dealers until the housing priorities are satisfied.

THE PRESIDENT OF THE BOARD OF TRADE has appointed committees to report on the information needed for future censuses of production, and to consider whether a regular census of distribution should be made. Sir George H. Nelson will be chairman of the Census of Production Committee, which is "to consider and report what additional information should be collected at future censuses of production, and to recommend what amendments should be made to the Census of Production Act." Sir Richard Hopkins will be chairman of the Census of Distribution Committee.

A DOCUMENT ON RECONSTRUCTION in the engineering industry is being presented to the appropriate Government departments by the National Engineering Joint Trades Movement. Mr. Jack Tanner gave details of it in his presidential address at the annual meeting of the National Committee of the Amalgamated Engineering Union. The main theme of the document, he said, was that upon the efficient and full utilisation of engineering capacity, upon the full employment of labour forces and the orderly planning of the conversion to peacetime engineering, rested the entire structure of this country.

THE BRITISH THOMSON-HOUSTON COMPANY, LIMITED, have recently received two important orders from the Government of New Zealand Public Works Department. One of these is for five 30,000-k.v.a., 750-r.p.m. synchronous condensers for operating on a 3-phase, 50-cycle, 11,000-volt supply. This order also includes the 11,000-volt solenoid-operated switchgear and neutral earthing cubicles, control panels, relay panels, temperature indicating equipment and voltage regulating equipments for use with the condensers. The other order is for thirteen 600-amp., 110-k.v., 2,500-m.v.a. oil circuit breakers, each with six bushing-type current transformers and solenoid operating mechanism.

OBITUARY

MR. THOMAS BUCHANAN, managing director of the Hammond Lane Foundry Company, Limited, Dublin, since its foundation, died recently. Born in Glasgow in 1871, Mr. Buchanan went to Dublin in 1902, and in company with Mr. David Frame, established the Hammond Lane Foundry. He was a member of the British Iron Founders' Association, and had been president of the Association of Irish Ironfounders.

MR. J. A. SMEETON, M.I.Mech.E., one of the best-known amongst the Victoria Street engineers, died on Sunday last. In his long career he had many and varied activities which brought him into contact with a very large number of engineers and foundrymen. Originally trained as a marine engineer, he later established himself as a consulting engineer and engineers' agent. His activities some 25 years ago were mainly centred around furnaces of various types. Then a few years after the last war he took over the British agency for Demag and a few other Continental concerns. Some of these brought him into close contact with the foundry industry—especially a scheme for using recuperated hot air in the cupola and the Perlit process. One of his most successful enterprises was the introduction of the Collin ladle from Belgium. He and a small party of engineers were in Liége at the time the Germans broke through. They all succeeded in returning, but by diverse routes. "Jack," as he was generally known by, was a member of the Institution of Mechanical Engineers, the Iron and Steel Institute and the Institute of British Foundrymen, and found time actively to participate in the work of all of them. Though he was 69 years old at the time of his death, he, like Peter Pan, never quite grew up. He invariably managed to impart an atmosphere of humour into all his personal contacts. Jack Smeeton will be sadly missed by foundrymen all over the country, as he was a real genius for making friends.

ENGINEERS' NEW WAGE STRUCTURE

The national committee of the Amalgamated Engineering Union have adopted the broad principles of a scheme brought forward by the executive council for a new wage structure. Instead of the present system of district rates, bonus, and differential payments, there would be three main grades of workers, each with a guaranteed weekly wage:—Labourers, £4 11s. (£6 1s. 4d. minimum piecework); skilled operators, £5 6s. (£7 15s. 4d.); and engineering craftsmen, £5 18s. (£7 17s. 4d.).

Mr. J. Tanner, the president, said this was not a detailed blue-print of what they considered the wages structure should be. It must have the endorsement of the other unions. What they wanted was to establish national standards. They claimed they were improving the status of the skilled man, and there was no levelling down.

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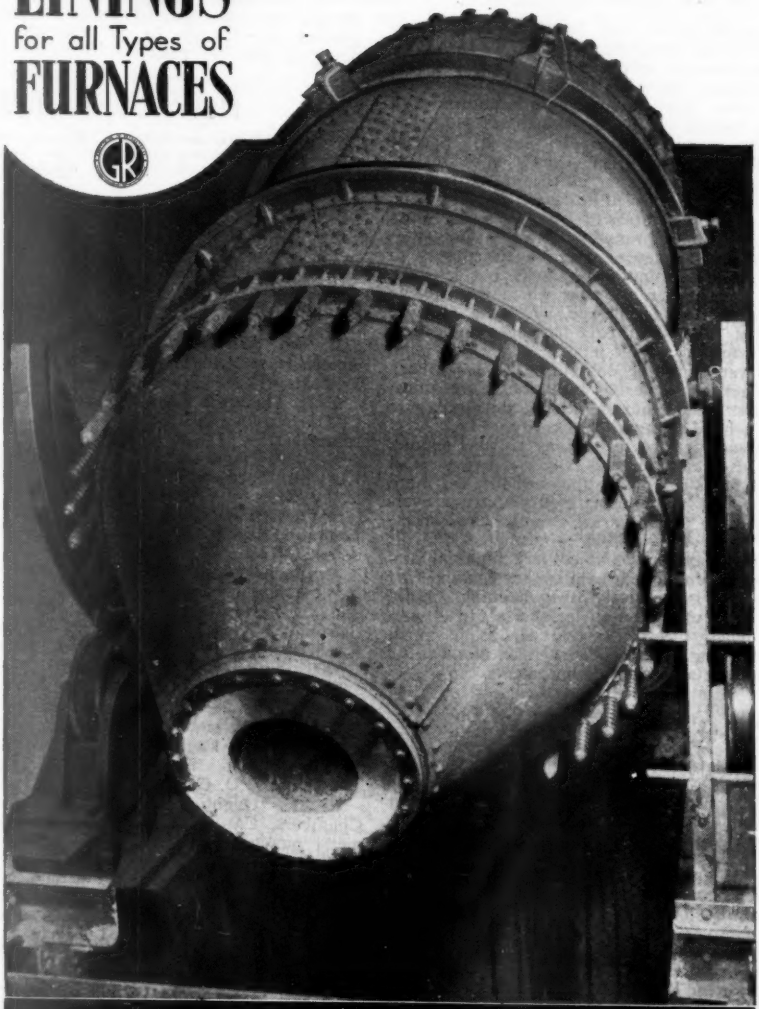

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Raw Material Markets

IRON AND STEEL

Although operations at the foundries are by no means brisk, while promising considerable acceleration when the housing drive really gets under way, the current output of pig-iron is fully absorbed. It is crystal clear that more high-phosphorus iron will soon be needed in the light-castings trade, but how it is to be provided is another matter. Special pig-iron for the engineering foundries is more readily obtainable, and the stringency in regard to ordinary foundry pig has been relieved to some extent by the improvement in the deliveries of iron and steel scrap.

Disposal of maximum outputs of steel semis presents no difficulty whatever. Producers appear to have cleared their accumulated stocks of defective material, and any further tonnages which may accrue are assured of prompt acceptance, while the pressure for prime billets and sheet bars has been intensified by the stoppage of the intake of Lease/Lend material. As yet, re-rolling operations have not been retarded by lack of material, but stocks are down to a very low level, and some of the mills are operating on a hand-to-mouth basis.

Removal of some of the restrictions on steel exports has already given an impetus to the heavy steel trade. Orders for steel plates and sections are more numerous, and the volume of inquiries from overseas is impressive. Outputs are rising, and order-books present a much healthier appearance. Mills which specialise in railway and colliery material are, of course, busily employed, while the demand for light gauge sheets is positively overwhelming. Only a small proportion of the output of sheets can be galvanised, but black sheets also are needed in much bigger tonnages, and at best it will take months for the makers to overtake their commitments.

NON-FERROUS METALS

Activity in the non-ferrous metals is on familiar lines. More metal is gradually being released for the manufacture of goods for home consumption and for export, but progress is slow, and few manufacturers have as yet got very far with their post-war plans. Consumption for war purposes meanwhile tends to decline still further.

The Non-Ferrous Metals Control has advised the London Metal Exchange that, in general, the requirements of liberated areas and certain other countries in respect of copper, lead and zinc will, until further notice, be met by the producers of these metals, either direct or through their agents or merchants. This procedure, however, is not always practicable where quantities under 10 tons are concerned. It has therefore been arranged that where foreign buyers of such small lots are unable to do business direct, the Control will offer copper to either the merchant in this country or the overseas buyer direct at the domestic statutory price. As regards zinc, an English source can supply small lots, but will not be able to replace such sale by buying from the Control. If there is no seller available, the Control will offer to either the merchant in this country or directly to the overseas buyer at the domestic statutory price.

NEW COMPANIES

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

Quinton Engineering Company (Leeds), 57, Headrow, Leeds, 1—£1,000. J. P. Walsh and J. Kirkman.

Scientific Engineering Corporation—£10,000. A. J. Wildey, 24, Elm Avenue, Oxhey, Herts, subscriber.

Avis Engineering Company, Cranbrook Buildings, Station Road, Ilford—£1,000. K. H. Bird and J. W. Elliott.

E. M. Wilcox, Acland Street, Peterborough—Acetylene welders, boiler makers, etc. £5,000. E. M. Wilcox.

C. R. Tindale & Company—Engineers, etc. £10,000. C. Glazebrook, 20, Copthall Avenue, London, E.C.2, subscriber.

Boyden, Short & Taylor (Engineers), 1a, Manor Row, Bradford—£1,000. R. W. Short, B. Taylor, and L. Boyden.

Samuel Platt, King's Hill Foundry, Wednesbury—Ironfounders, engineers, etc. £75,000. P. W. Platt and A. W. Maley.

Joseph Toole, West End Ironworks, Middleton Road, Oldham—Ironfounders, etc. £5,000. D. D. and R. B. Newton.

Fredk. J. Hope (Cirencester), 78, Watermoor Road, Cirencester, Glos—Welding and general engineers. £5,000. F. J. Hope and E. Lock.

L. Dainty, James Hill Works, Little Aston Road, Aldridge, Staffs—Furnace builders, etc. £3,000. L. and H. Dainty and G. W. Cooke.

Porthminster Engineering—£1,000. G. R. Saunders, 10, Downfields, Welwyn Garden City; W. Bibby, J. F. Eccles, D. C. Tibbles, and G. J. V. Saunders.

R. L. Oughton & Company, Midland Bank Chambers, Castle Square, Swansea—Scrap iron and metal merchants. £1,500. R. H. Oughton and E. Oughton.

Jaru, River Plate House, Finsbury Circus, London, E.C.2—Manufacturers of bearings, oil and other seals and component parts of aircraft, motor cars, etc. £10,000. Miles Aircraft, Limited, and Sir George Godfrey & Partners, Limited, may each appoint one director.

Carbon & Graphite (Products) Association, 1, Old Broad Street, London, E.C.2—Subscribers, each of whom may nominate a member of the Council: Morgan Crucible Company, Battersea, London; General Electric Company; Reckitt & Colman; James C. Waterhouse; Ever Ready Company (Great Britain); Ship Carbon Company of Great Britain.